HEALTH ZONE

AAEP Convention

Top Equine Studies of 2014

BY ALEXANDRA BECKSTETT, ERICA LARSON, AND DR. NANCY LOVING

To kick-start the convention's educational sessions, three veterinarians presented their favorite studies from the past year to their peers. Dr. Lisa Fortier, (on the right in the image below) professor of Large Animal Surgery at Cornell University, in Ithaca, N.Y., shared lameness and surgery picks; Dr. Carol Clark, (center) of Peterson & Smith Equine Hospital, in Ocala, Fla., presented medicine studies; and Dr. Terry Blanchard, (left) theriogenology professor and researcher at Texas A&M University, in College Station, tackled reproduction topics.

Stem Cells for Treating Stifle Lesions

Fortier began by describing a "landmark paper" evaluating the outcome of horses with meniscal, cartilage, or ligamentous stifle lesions treated with a combination of surgery and intra-articular (in the joint) mesenchymal stem cells (MSCs) and hyaluronic acid injections. She said 44% of all horses returned to work following treatment; of those, 75% with meniscal disease returned to work (compared to 60% of control horses). Her take-home was that MSCs appeared to benefit meniscal lesion cases.

Nerve Block Variability

Next, she described two studies on blocks for the deep branch of the lateral plantar nerve, used to diagnose hind limb suspensory desmitis (inflammation of the ligament). There's a high degree of variability with these blocks, Fortier said; high-volume injections diffused more than low, and analgesia traveled up to 2 cm above and up to 5 cm below the injection site. Additionally, 37% of horses had evidence of analgesia in the tarsal sheath, and 24% of horses in the tarso-metatarsal joint (a low-motion hock joint).

The take-home? Blocks aren't specific. So, if the horse responds favorably, use diagnostic imaging to see what's going on.

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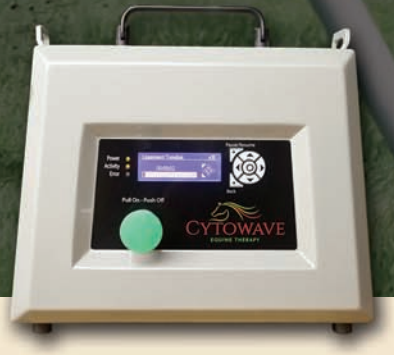

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CT to Assess Hock Lameness

Next, Fortier described a paper in which scientists retrospectively evaluated CT findings in horses with tarsal lameness. They found a variety of pathologies within the hock, Fortier said, some of which weren't visible on other imaging modalities. Thus, she encouraged practitioners to seek further diagnostic information via a 3-D modality (like CT or MRI) if radiographs and/or ultrasound appear clean in a horse exhibiting hock lameness.

Abnormal Breathing Patterns and Respiratory Disease

Changing gears, Fortier described a study in which researchers evaluated whether abnormal breathing patterns at the canter and gallop are associated with respiratory tract disease. They studied 365 horses referred for evaluation due to poor performance or an upper respiratory tract obstruction.

The frequency of abnormal breathing patterns decreased as speed increased. Also, horses with a 2:1 pattern (taking one breath over two strides instead of one breath per stride) at higher speeds were more likely to have upper respiratory tract disease, while horses with abnormalities at lower speeds could have either upper or lower respiratory tract disease.

Fortier's take-home: While not every horse with an airway obstruction will have a 2:1 breathing pattern, all affected horses warrant further upper and lower respiratory tract investigation.

Ophthalmology Studies

Clark began her medicine synopsis by describing several papers on eye problems. The first was on treating corneal stromal abscesses with 5% voriconazole (an antifungal) solution by injecting the drug immediately adjacent to the anterior stroma rather than directly into the abscess, as veterinarians more typically do. Necessary treatment time decreased from the reported average of eight weeks down to 5.5 weeks and resulted in less scarring.

Next, Clark reviewed a retrospective (2006-13) study of 18 cases of orbital (surrounding the eye) fractures. In more than half of the cases, the researchers noted comminuted fractures (tiny bone fragments). They also noted that epistaxis (nosebleed) likely indicates sinus

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When topical eye medications are applied, there is always a concern that it could stimulate bacterial growth

involvement. In addition, they identified neurologic signs in a horse that had reared in a confined space and suffered traumatic brain injury. In general, they were fairly successful in treating all cases, with nearly 87% returning to previous function and 60% with good cosmetic appearance.

Then Clark presented a paper in which veterinarians evaluated the use of cyclosporine implants to control immune-mediated keratitis (corneal inflammation). The researchers placed two to four of these silicone implants into 20 eyes and determined that it helped effectively control superficial (near the surface) and endothelial (the inner layer of the cornea) forms of keratitis, and the horses came off all or all but one topical medication through the follow-up of 14-18 months.

When applying any topical eye medication, there is always a concern that it could stimulate bacterial growth, thereby complicating the case. Clark described a study that showed no difference in bacterial growth in the eye with or without topical anesthetic tetracaine treatment.

Respiratory Conditions

Clark reviewed a paper in which the authors evaluated the correlation between airborne particulates and tracheal mucus at a Thoroughbred racetrack. If there is sufficient mucus in the respiratory tract, a horse experiences exercise compromise due to inflammation—the higher the mucous score, the greater the number of inflammatory cells. Of 649 study horses, 23% had mucous scores high enough to affect performance. The researchers found particulate contamination within a horse's rebreathing zone (the 2-foot area directly around the muzzle and face) was higher in stalls during the evening hours. They suggested implementing management practices that reduce ambient particulates in the stall and barn, such as improved ventilation and dust control.

Clark also summarized the effects of environmental exposure on airway inflammation in 49 Thoroughbreds during their first month of training. The researchers measured horses' exposure to particulates, endotoxin, and ammonia and compared it to what they found on airway cytology (cell study). Particulates and airway inflammation especially increased with haynet use. Increased eosinophil (a type of white blood cell) numbers on cytology suggested allergic hypersensitivity related to environmental factors, the researchers concluded. Of the horses with increased eosinophil counts, 72-81% had some form of inflammatory airway disease (IAD) during the study.

Researchers suggest implementing management practices that reduce ambient particulates in the stall and barn such as improved ventilation and dust control

In another study, researchers examined omega-3 fatty acid supplementation coupled with a low-dust diet to manage chronic lower airway inflammation. They determined that the best way to reduce airway inflammation is to remove hay; this led to 65% reduction in abnormal airway signs. Combining environmental control strategies with omega-3 fatty acid supplementation offered more benefits.

Heart Problems in Athletic Horses

Clark reported that the American College of Veterinary Internal Medicine and European College of Veterinary Internal Medicine have prepared a consensus statement on how to diagnose and manage cardiac murmurs and arrhythmias. "The majority of horses with cardiovascular abnormalities can have some athletic use," she said. "Periodic re-evaluations are important as many conditions are progressive." She said a horse should not engage in athletic activities if veterinarians find evidence of pulmonary hypertension (abnormally high blood pressure in the arteries of the lungs); congestive heart failure (end-stage heart damage); or complex ventricular abnormalities (which alter the heart's strength and/or rhythm).

ANNE M. EBERHARDT

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Stem Cells to Treat Endometritis

Colorado State University researchers set out to determine whether biological treatments, such as autologous conditioned serum (ACS) and MSCs, could help modulate the inciting inflammatory response in mares with persistent mating-induced endometritis. They determined that both treatments decreased inflammatory response six hours post-insemination. They also found that MSCs increased the inflammatory mediator IL-1Ra, which Blanchard said might be very important in helping to control some of the effects of interleukin-1, a common pro-inflammatory cytokine produced during post-mating endometritis. Overall, they concluded that stem cells might benefit these cases.

CCFA as an Endometritis Treatment

In this experimental study, Colorado State University researchers evaluated ceftiofur crystalline free acid (CCFA) levels in the endometrium after intramuscular administration. They gave the antibiotic—normally used for lower respiratory infections—to three groups of mares (at a 6.6 mg/kg body weight dose) at various intervals and collected blood and endometrial biopsy samples. Upon analyzing these, the team determined that CCFA remains at endometrial levels above the minimum concentration for inhibiting the growth of Streptococcus zooepidemicus, the most common cause of infectious endometritis, for up to six days.

PRP's Effects on Endometritis

In an effort to provide veterinarians with another treatment option for persistent endometritis, researchers evaluated autologous (derived from the horse's own blood) platelet-rich plasma's (PRP) effects on uterine inflammatory response when infused into the uterus after artificial insemination (a common cause of inflammation that can inhibit fertility). The team found that in susceptible mares, uterine fluid, nitric oxide levels, and percentage of neutrophils (the most abundant type of white blood cell) all decreased after PRP was administered four hours post-breeding. These measurements indicate a reduced inflammatory response, leading Blanchard to conclude that PRP might provide another effective treatment option for this condition. BH

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